THE RECIPROCAL INFLUENCES OF ASTHMA AND PREGNANCY IN MALTESE WOMEN

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Introduction

Asthma has been reported to complicate 1% of pregnancies and increase the likelihood of prematurity and low birth weight (Gordon et al, 1970). Pregnancy itself may alter the course of asthma. In general, one third of women feel that their asthma improves during pregnancy, one third feel that it deteriorates, while another third feel that pregnancy has no effect on their asthma (Weinstein et al, 1979).

The management of asthma in the pregnant patient does not differ greatly from that in patients who are not pregnant. Although it is wise to avoid all drugs, especially in the first trimester, it is important to remember that the potential hazards of uncontrolled asthma are much more likely to endanger the life of both mother and foetus (DiMarco 1989). Regular visits, during which asthma severity and therapeutic responsiveness are assessed, both objectively (with pulmonary function tests) and subjectively, are recommended in order to achieve the desired therapeutic goals in asthmatic females who require regular medication during pregnancy (Shatz et al, 1991).

To try and evaluate the situation in Malta, the aims of this study were to:

1. Investigate the effect of asthma on the outcome of pregnancy over the past 5 years.

2. Determine, subjectively, the effect of pregnancy on the course of asthma and carry out a preliminary study on the incidence of premenstrual exacerbation of asthma.

3. Determine how the asthmatic pregnant patient is managed at the Ante Natal Clinic at St Luke's Hospital (SLH) and establish the importance of the clinical pharmacist in this area.

4. Investigate the management and attendance of pregnant asthmatic women at the Asthma and Allergy Clinic at SLH.

Methodology

Study 1

Retrospective Study

The effect of asthma on the outcome of pregnancy was studied retrospectively from the medical histories of 106 women with a history of asthma who gave birth between January 1987 and September 1991. These subjects were obtained by going through the birth records (where any condition the mother suffered from was noted) for that period and through the Computer Centre at St Luke's Hospital.

The women were classified as 'very mild', 'mild' 'moderately severe' and 'severe' (Groups I to IV respectively, depending on the treatment and severity of their asthma during their pregnancy. Group I was further split into A and B, group A being those women not requiring any treatment at all. The number of females in each of the Groups IA, IB, II, III, IV were 42, 33, 12, 11 and 8 respectively.

Parameters investigated included: birth outcome, birthweight, maturity, miscarriage, Apgar score, occurrence of malformations, transfer to the Special Care Baby Unit (SCBU), type of delivery and drugs used during labour. In the case of the birth of more than 1 child during this period, the most recent birth was used in this study.

These parameters were compared to those obtained for a control sample of an equal number of normal, non-asthmatic women picked at random from the birth records. The mean age of the women was 27 years in both asthmatic and control groups, with an age range of 16-42 and 16-37 respectively.

Trends in smoking during pregnancy were also studied in the group of asthmatic women but not compared with the controls.

The results of this study were subjected to statistical analysis using Student's t-test and the Chi Square test.

Study 2

Survey to pregnant asthmatic women

The effect of pregnancy on the course of asthma was investigated by conducting a survey to 37 pregnant asthmatic women who had been registered at the Ante-Natal Clinic (ANC) between June and December 1991. The subjects were obtained by going through all the files in the ANC to find out which patients had been registered as asthmatic when booking ante-natal care and enlisting the help of the nurses of booking the women in.

The survey was a verbal one conducted by patient interview at the ANC or, for the most part, by telephone. Questions were set to determine the women's asthmatic characteristics: age of onset, family history, trigger factors, medication and severity (mild, moderate or severe). Women were also asked about their smoking habits and the occurrence of asthma during pregnancy and its medication. The main aspect of this survey was about the course of their asthma during their current pregnancy and whether it was similar between successive pregnancies.

This survey also included a preliminary study on the exacerbation of asthma premenstrually.

Study 3

Questionnaire to Obstetricians

A questionnaire about the management of asthma during pregnancy was distributed to 30 obstetricians and obstetricians-in-training. The questions were set to determine if, when and how they treat and monitor this condition, their opinion about collaboration with a chest specialist and their ideas about the features being investigated in Studies 1 and 2.

This questionnaire was also intended to obtain their views about the role of the clinical pharmacist in the assessment, thereapeutic management, monitoring and education of these patients.

Study 4

A visit was paid to the Asthma and Allergy Clinic to determine the aims of the clinic and how they are achieved. The attendance of pregnant asthmatic women was also investigated.

Results

Study 1

Outcome of pregnancy: all the births were live births with no apparent malformations, both in the asthmatic and control groups.

Table 1: Clinical characteristics of newborn infants of asthmatic and control women

	Asthmatic Patients		Control
	Groups I, II	Groups III, IV	
Number of infants	89*	19	106
Gestational age (days, mean [SD])	275 (9)	277 (17)	278 (11)
Birth weight (grams, mean [SD])	3278 (399)	3145 (697)	3339 (491)
Abgar score <6 at 1 min (%)	4 (4.5%)	5 (26.8%)	6 (5.7%)
Transferred to SCBU (%)	1 (1.1%)	1 (5.3%)	3 (2.8%)

* 2 women had twins

Labour and delivery: labour was induced in 54.7% of the asthmatic women and 17% of the control women. 8 of the births in each group were by Caesarean section and in both groups, 3 of them elective. Forceps were used in 4 births of the asthmatic group, but in only 1 of the control group.

All deliveries were otherwise normal and all had a cephalic presentation except for 1 case in the asthmatic group which was breech.

Ergotocin was used after 70 'asthmatic' deliveries and 100 control deliveries, while pethidine and sparine were used in 41 and 65 women respectively.

Miscarriage: Taking all past births and miscarriages of all the women, the incidence of miscarriage was 8.4% in both groups.

Smoking trend: 16 of the asthmatic women smoked. The mean birth weight of their infants was slightly lower than the rest.

The gestation period of women in Group IV was significantly ($p<5$) shorter than that in the control group. On the other hand, the gestational period in Group III was significantly ($p<5$) longer than that in both Groups I and II.

The birth weight of infants in group IV was significantly ($p<1$) lower than that of those in Group I and the control group.

A significantly higher percentage of neonates from Groups III and IV were transferred to the SCBU than from Group I and the control group. Group I also had a significantly lower percentage of neonates in the SCBU than Group II ($p<5$).

Study 2

The mean age of the women was 28 years (range: 19-40). The mean age of onset was 14.5 years, ranging from early infancy (<1) to adulthood (36). It resulted that 9 of the women (24%) associated pregnancy with their becoming asthmatic, although 1 of these women had already been asthmatic in her childhood.

Twenty-two women used a bronchodilator aerosol during pregnancy. Eight were taking inhaled steroids, one inhaled cromoglycate, five oral bronchodilator therapy and the woman with severe asthma was on oral corticosteroids. Twelve women were taking no anti-asthmatic therapy at all during pregnancy. Three women, all in the 'moderate' group, required nebuliser therapy during pregnancy, but no hospitalisation was required for any of the women. The subjective course of asthma in 37 women is shown in Figure 1.

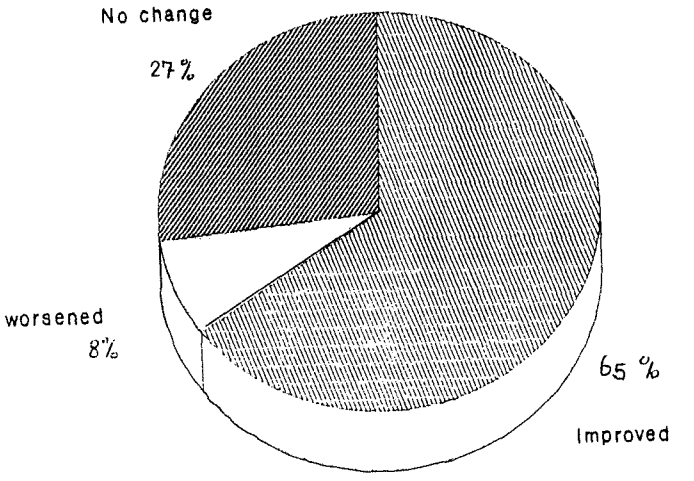


Figure 1: Subjective course of asthma in 37 pregnancies

The present pregnancy was the first for 10 of the women, while another 8 were not yet asthmatic in their first pregnancy. In 10 (63%) of the remaining 27, asthma followed the same course as in the immediately-preceding pregnancy.

24 (65%) had an allergic basis to their asthma, 18 (49%) had a family history of asthma or of allergy and 4 (11%) of the women smoked during pregnancy.

14 women (38%) were aware of a premenstrual exacerbation of their asthma, including all 3 women whose asthma deteriorated during pregnancy.

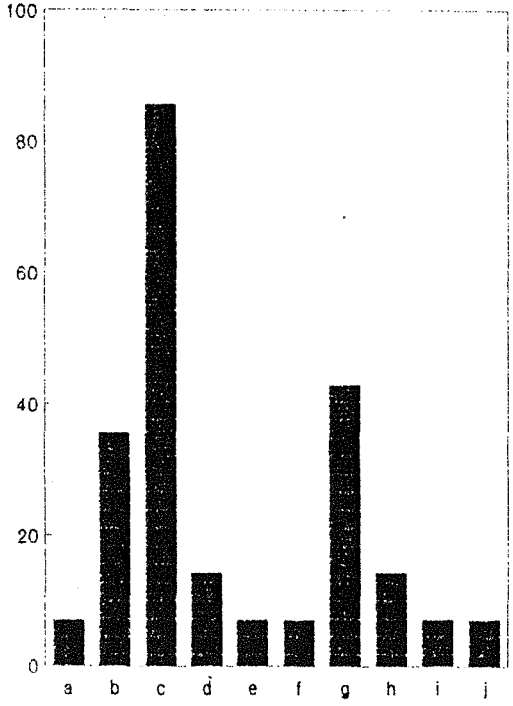
Study 3

The questionnaire to obstetricians had a 46.7% response. Each respondent sees less than 20 asthmatic, pregnant women per year, 71% seeing less than 10. The patient is determined as asthmatic by means of patient interview, medical file and physical examination, but only 4 respondents would use pulmonary function tests to assess asthma severity.

The majority (71%) consider the prevention of an asthmatic attack more important than possible complications of treatment, yet only half of these would start treatment immediately. Generally, normal anti-asthmatic treatment is continued, or the asthma is treated according to its severity. Therapy comprises: inhaled beta-2 agonists (100%), oral beta-2 agonists (64%), inhaled corticosteroids (29%) and prophylactic agents (7%). Drugs avoided during pregnancy are shown in Figure 3. Systemic corticosteroids are avoided mainly because of teratogenic risk to the foetus and because of foetal adrenal gland suppression (25%). Obstetric drugs that are avoided in asthmatic patients are also shown in Figure 2.

11 (79%) respondents thought that regular consultation with a chest specialist would be beneficial to the asthmatic patient, but only 5 refer such patients on the first ante-natal visit. Monitoring of progress by means of pulmonary function testing is carried out by only 4 (29%) of the respondents, since they are mostly used when the patient is admitted to hospital for an exacerbation of asthma (79%).

The opinion of the effect of asthma and anti-asthmatic drugs on pregnancy is shown in Figure 3, while that on the effect of pregnancy on asthma is shown in Figure 4.



a = oral beta agonists

b = xanthine b'dilators

c = systemic C/steroids

d = prophylactic agents

e = inhaled C/steroids

f = no drugs

g = pethidine

h = prostaglandins

i = ergometrine

j = general anaesthetic

Figure 2: Drugs avoided in the pregnant asthmatic patient

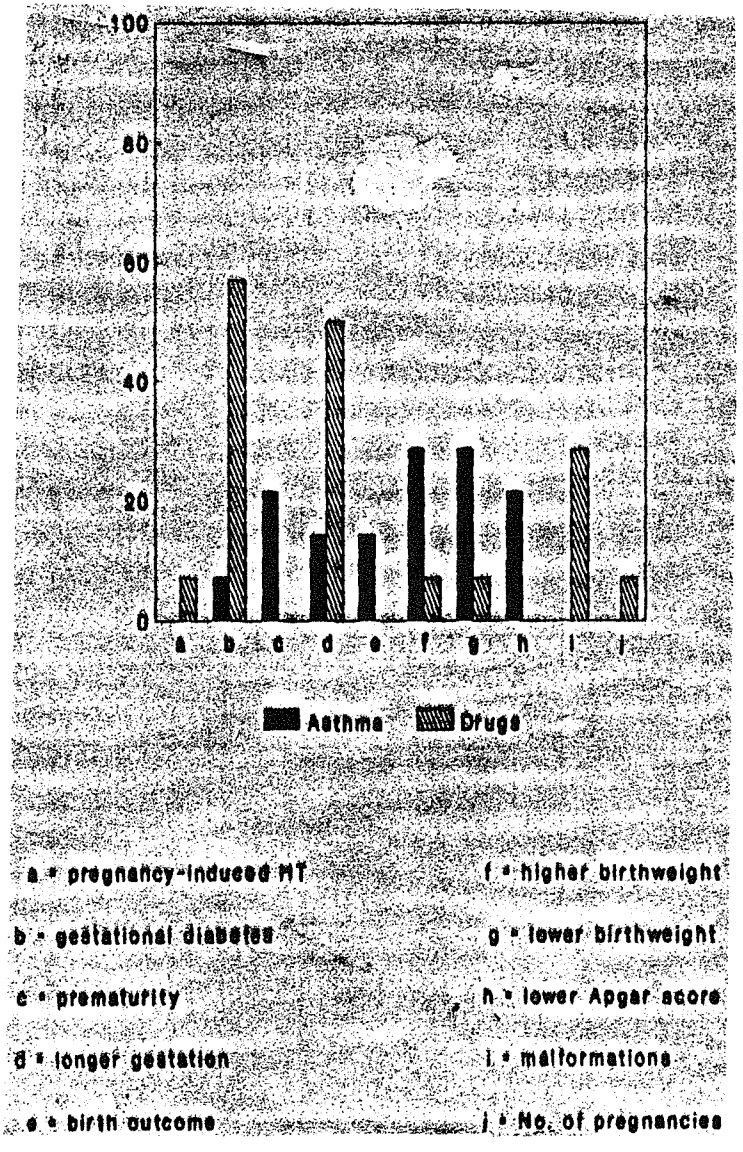


Figure 3: Opinion of the effect of asthma on pregnancy

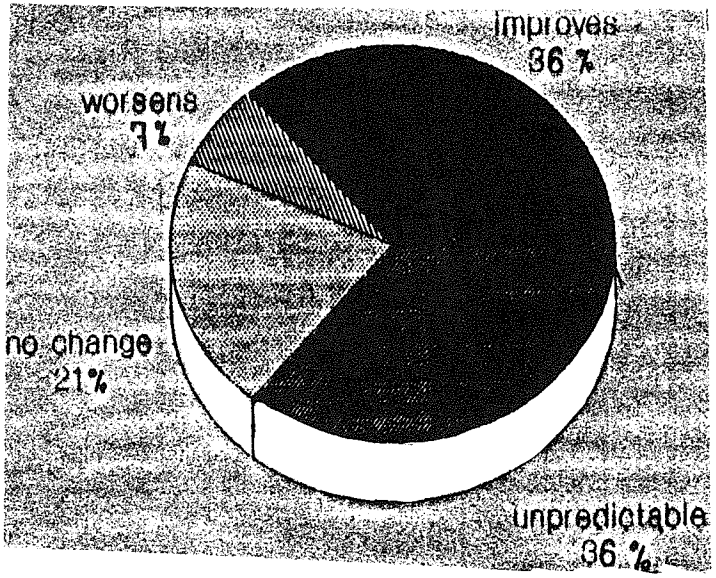


Figure 4: Opinion on the effect of pregnancy on asthma

Of the 64% who thought that gestation age was likely to affect asthma severity, 55% thought asthma deteriorated in the last 4 weeks of pregnancy. Exactly half agreed that asthma may have a menstrual rhythm.

The opinion of the obstetricians on the role of the clinical pharmacist in the management of asthma during pregnancy is shown in Figure 5.

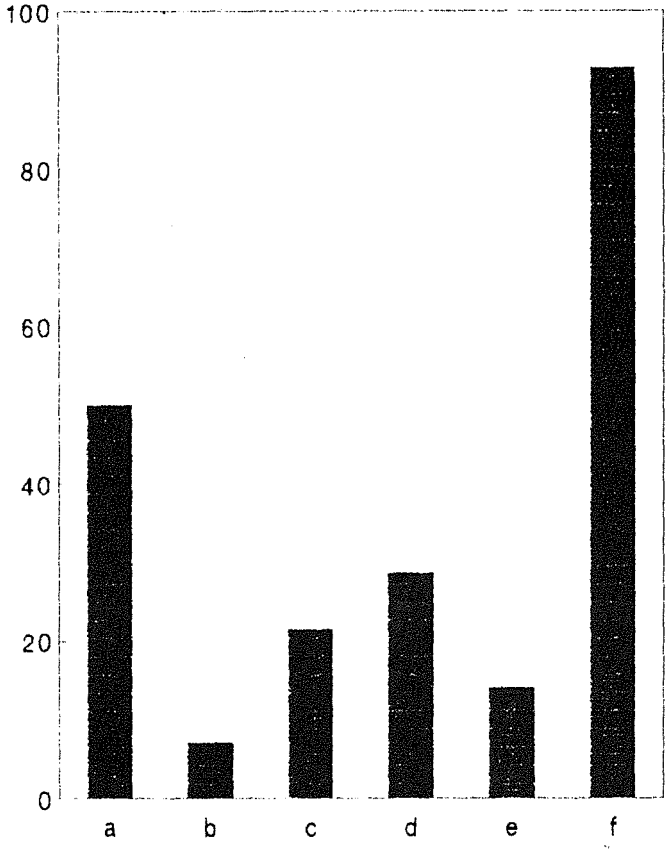


Figure 5: Opinion of the role of the Clinical Pharmacist in the management of asthma during pregnancy

Study 4

This visit showed that so far, only two pregnant asthmatic patients have been to the clinic, only 1 of these having been referred by the Department of Obstetricians and Gynaecologists. The main aims of the clinic are to reduce asthma symptoms as much as possible and bring pulmonary function testing back to normal by regular consultation visits and pulmonary function testing (FEV, FVC, PEFR). It resulted that all asthmatic pregnant patients would be better off if they visited this clinic regularly.

Conclusion

Asthma, when well-controlled, seemed to have precipitated no real emergencies with respect to birth outcome, during the past five years. 65% of asthmatic women appear to improve during pregnancy, while the fact that 38% suffer from premenstrual asthma contributes further to the existence of this relationship (not invariably accepted). The pharmacist may have an important role as a link between the chest specialist and the obstetrician and even more so in educating the patient about her asthma and its treatment. This service would optimize the management of asthma during pregnancy and hence, the mother's health and the outcome of birth.

References

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